

# Medicine Lodge Subbasin Assessment and TMDLs

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**February 18, 2003**

## 2. Subbasin Assessment – Water Quality Concerns and Status

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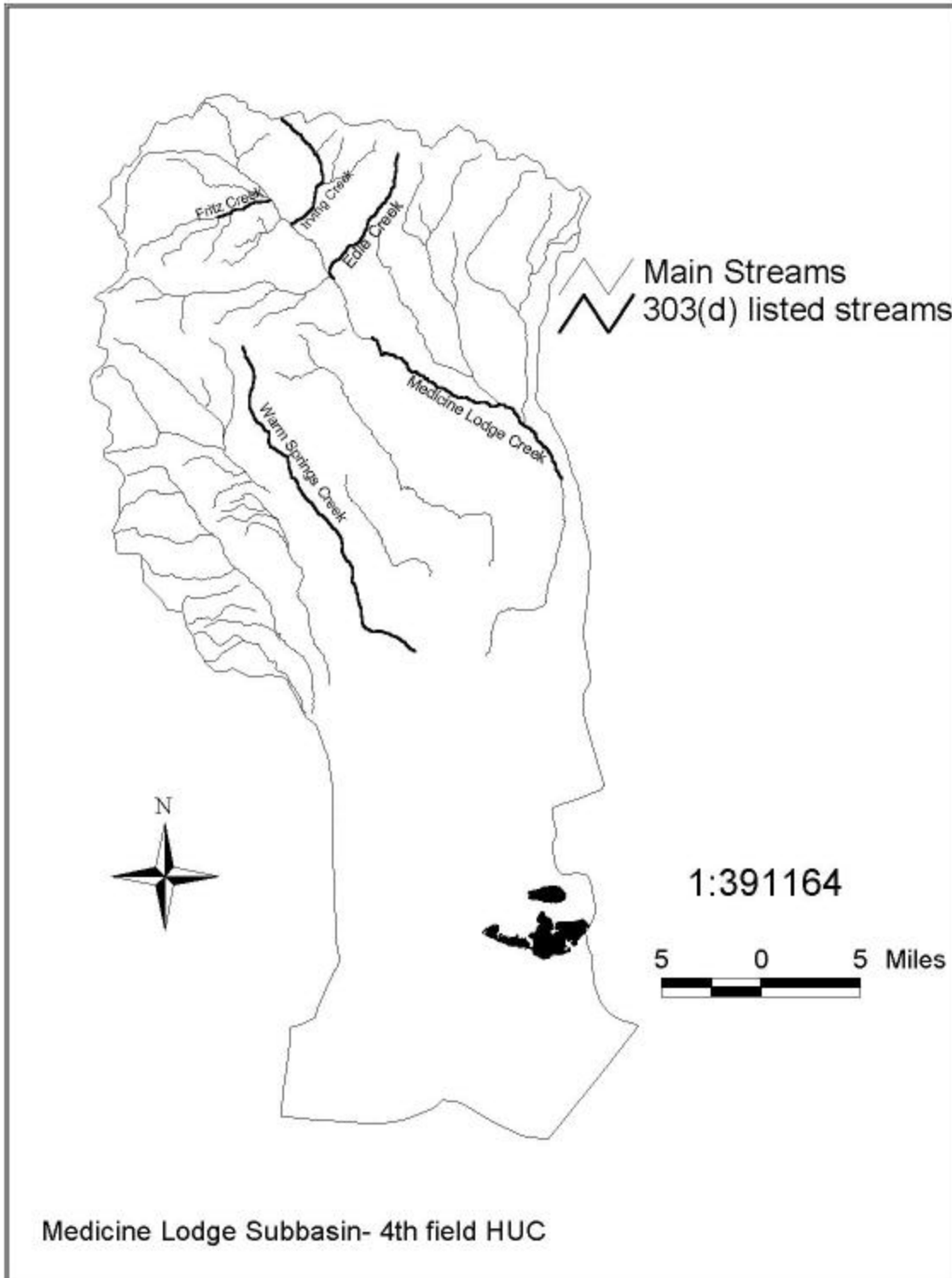
### 2.1 Water Quality Limited Segments Occurring in the Subbasin

The Medicine Lodge Drainage has five stream segments that are included on the Idaho 1998 § 303(d) list. The 303(d) list is of waters that are impaired or that need further assessment, meaning that streams are not meeting the requirements of their beneficial uses. The stream segments are shown in Figure 16 and are described in Table 8. These streams were listed because of their presence in the *1992 Water Quality Status Report* (DEQ 1992) also known as the 305(b) report.

Warm Springs Creek was shown in Appendix A of the 1992 305(b) report to be in non-support of cold water aquatic life and salmonid spawning, and threatened for the use of agricultural water. Warm Creek was shown to be in non-support for primary contact recreation and in threatened support of agricultural water, cold water aquatic life, salmonid spawning, and secondary contact recreation.

Warm Creek was de-listed in 1996 because it was found to be in full support of its beneficial uses after assessment of the macroinvertebrate data from BURP. The boundaries of the 303(d) listing for Medicine Lodge Creek were also changed at this time decreasing the listed stream miles from 24.17 miles to 16.20 miles (DEQ 1998).

The Water Quality Working Committee in 1992-1994 (DEQ 1992-1994) nominated most of the streams that are now listed as stream segments of concern (SSOC). The streams nominated included Medicine Lodge Creek, Edie Creek and Irving Creek with the primary objective of maintaining or restoring water quality. The comments on the SSOC nominations were primarily focused on protecting the fisheries. People were also concerned with impact from recreation on Medicine Lodge Creek and poor livestock management on Irving Creek. None of these nominations became designated SSOCs in this watershed, which means that they obtained their listing status from the 305 (b) report. Table 8 lists the 303(d) listed streams within Medicine Lodge subbasin. Locations of listed streams are depicted in Figure 16. See Appendix C for the Water body identification numbers and their boundaries for the entire Medicine Lodge Subbasin.



**Figure 16. Medicine Lodge Subbasin 303(d) Listed Streams**

**Table 8. 1998 303 (d) streams in the Medicine Lodge Watershed**

<b>Stream</b>	<b>1998 303 (d) Boundaries</b>	<b>WBID No.</b>	<b>Pollutants</b>	<b>Listing Basis</b>
Medicine Lodge Creek	Spring Hollow Creek to Small, ID	6,2	Flow Alteration, Sediment, Temperature	1992 305(b) appendix D
Edie Creek	Headwaters to Medicine Lodge Creek	10	Habitat Alteration, Nutrients, Sediment	1992 305(b) appendix D
Irving Creek	Headwaters to Medicine Lodge Creek	12	Habitat Alteration, Nutrients, Sediment	1992 305(b) appendix D
Fritz Creek	Forks to Medicine Lodge Creek	16	Nutrients, Temperature	1992 305(b) appendix D
Warm Springs Creek	Headwaters to Sinks	20	Nutrients, Sediment	1992 305(b) appendix A

## 2.2 Applicable Water Quality Standards

The Idaho water quality standards are designed to meet the goals of the Clean Water Act (CWA). The goal stated in the CWA that is especially relevant to designated uses is section 101 (a) (2) which states that:

“wherever attainable, water quality should provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water.”

Idaho’s water quality standards are published at *IDAPA 58.01.02-Water Quality Standards and Wastewater Treatment Requirements*. These standards consist of three parts: designated uses of waters, numeric or narrative criteria to protect those uses, and an antidegradation policy. Table 9 lists all of the designated beneficial uses for Medicine Lodge.

### Designated Uses

The following is an excerpt from Idaho’s water quality standards which lists the designated beneficial uses for surface waters:

#### *Water Supply*

- a. Agricultural (AWS): water quality appropriate for the irrigation of crops or as drinking water for livestock. This use applies to all surface waters of the state.
- b. Domestic (DWS): water quality appropriate for drinking water supplies.

- c. Industrial (IWS): water quality appropriate for industrial water supplies. This use applies to all surface waters of the state.

#### *Aquatic Life*

- a. Cold water aquatic life (CWAL): water quality appropriate for protection and maintenance of viable aquatic life community for cold water species.
- b. Salmonid spawning (SS): waters which provide or could provide a habitat for active self-propagating populations of salmonid fishes.

#### *Recreation*

- a. Primary contact recreation (PCR): water quality appropriate for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur. Such activities include, but are not restricted to, those used for swimming, water skiing, or skin diving.
- b. Secondary contact recreation (SCR): water quality appropriate for recreational uses on or about the water and which are not included in the primary contact category. These activities may be used for fishing, boating, wading, infrequent swimming and other activities where ingestion of raw water is not likely to occur.

#### *Wildlife Habitats*

Water quality appropriate for wildlife habitats. This use applies to all surface waters of the state.

#### *Aesthetics*

This use applies to all surface waters of the state.

Any water that does not have an official designated use is addressed in section 58.01.02.101 of the IDAPA, entitled “Undesignated Surface Waters”. It states that, “Prior to designation, undesignated waters shall be protected for beneficial uses, which includes all recreational use in and on the water and the protection and propagation of fish, shellfish, and wildlife wherever attainable.” These undesignated waters are presumed to support cold water aquatic life and primary contact recreation. Any use that has existed since November 28, 1975 is also protected if there is indicative information to show its presence. Industrial water supply, wildlife habitat and aesthetics are also designated for all waters of the state.

The Special Resource Water (SRW) designation is defined in the standards as a specific segment or body of water which is recognized as needing intensive protection to a) preserve outstanding or unique characteristics, or b) maintain a

current beneficial use. The only stream with a SRW designation is Medicine Lodge Creek. The primary aim of the SRW designation is to protect beneficial uses against point sources of pollution eliminates any new point source from receiving a NPDES (National Pollutant Discharge Elimination System) and keeps any current source from increasing its discharge. Since there are no point sources of pollution in Medicine Lodge, this designation would keep any from being developed along the Medicine Lodge Creek. No new point sources will be allowed in any of the tributaries if their discharge would decrease the water quality in Medicine Lodge Creek.

### Water Quality Criteria

Water quality criteria specify the chemical, physical and biological conditions that a stream must meet in order to achieve and protect a beneficial use. The criteria relevant to the Medicine Lodge Subbasin are discussed in sections 200, 250, 251, and 252 of the Idaho Administrative Code (IDAPA 58.01.02).

All of the 1998 303(d) listed streams in the subbasin are listed for sediment except for Fritz Creek. The water quality standards states that, "Sediment shall not exceed quantities...which impair designated beneficial uses." (IDAPA 58.01.02.200.08)

All of the 1998 303(d) listed streams in the subbasin except Medicine Lodge Creek are listed for nutrients. The water quality standards for excess nutrients states, "Surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses." (IDAPA 58.01.02.200.06)

Medicine Lodge Creek and Fritz Creek are listed for temperature and both have designated beneficial uses of both Cold Water aquatic life and Salmonid Spawning. The temperature criteria is different for cold water aquatic life (CWAL) and for salmonid spawning (SS). For CWAL the standards states, "Water temperatures of twenty-two (22) degrees C or less with a maximum daily average of no greater than nineteen (19) degrees C." For SS the standards are, "Water temperatures of thirteen (13) degrees C or less with a maximum daily average no greater than nine (9) degrees C.

### Antidegradation Policy

Idaho's Antidegradation Policy (IDAPA 58.01.02.051) maintains the existing uses for all waters by stating that "existing in stream water uses and the level of water quality necessary to protect existing uses shall be maintained and protected."

It protects high quality waters but allows for development by stating that, "where the quality of the waters exceeds levels necessary to support propagation of fish, shellfish and wildlife and recreation in and on the water, that quality shall be

maintained and protected unless the Department finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the Department's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the Department shall assure water quality adequate to protect existing uses fully."

The Antidegradation Policy also addresses outstanding resource waters. "Where high quality waters constitute an outstanding national resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected from the impacts of point and nonpoint source activities."

**Table 9. Designated Beneficial Uses for Medicine Lodge Subbasin**

Stream	Boundaries	WBID No.	Aquatic Life	Recreation	Other
Mud Lake		1			
*Medicine Lodge Creek	Indian Creek to playas	2	COLD, SS	PCR	DWS, SRW
Indian Creek	confluence of Indian Creek forks to mouth	3			
Indian Creek, E. Fork	source to mouth	4			
Indian Creek, W. Fork	source to mouth	5	COLD, SS	SCR	
*Medicine Lodge Creek	Edie Creek to Indian Creek	6	COLD, SS	PCR	DWS, SRW
Middle Creek	Dry Creek to mouth	7			
Middle Creek	source to Dry Creek	8			
Dry Creek	source to mouth	9			
*Edie Creek	source to mouth	10	COLD, SS	SCR	
Medicine Lodge Creek	confluence of Warm and Fritz Creeks to Edie Creek	11	COLD, SS	PCR	DWS, SRW
*Irving Creek	source to mouth	12	COLD, SS	SCR	
Warm Creek	source to mouth	13	COLD, SS	SCR	
Divide Creek	source to mouth	14			
Horse Creek	source to mouth	15			
*Fritz Creek	source to mouth	16	COLD, SS	SCR	
Webber Creek	source to mouth	17	COLD, SS	SCR	
Deep Creek	source to mouth	18			
Blue Creek	source to mouth	19			
*Warm Springs Creek	source to mouth	20			
Crooked Creek	source to mouth	21			
Chandler Canyon		22			

Source: Idaho Administrative Code, IDAPA 58.01.02

\*= 303 (d) listed streams

SS= Salmonid Spawning

PCR= Primary Contact Recreation

SCR= Secondary Contact Recreation

COLD= Cold Water Aquatic life

DWS= Domestic Water Supply

SRW= Special Resource Water



## 2.3 Summary and Analysis of Existing Water Quality Data

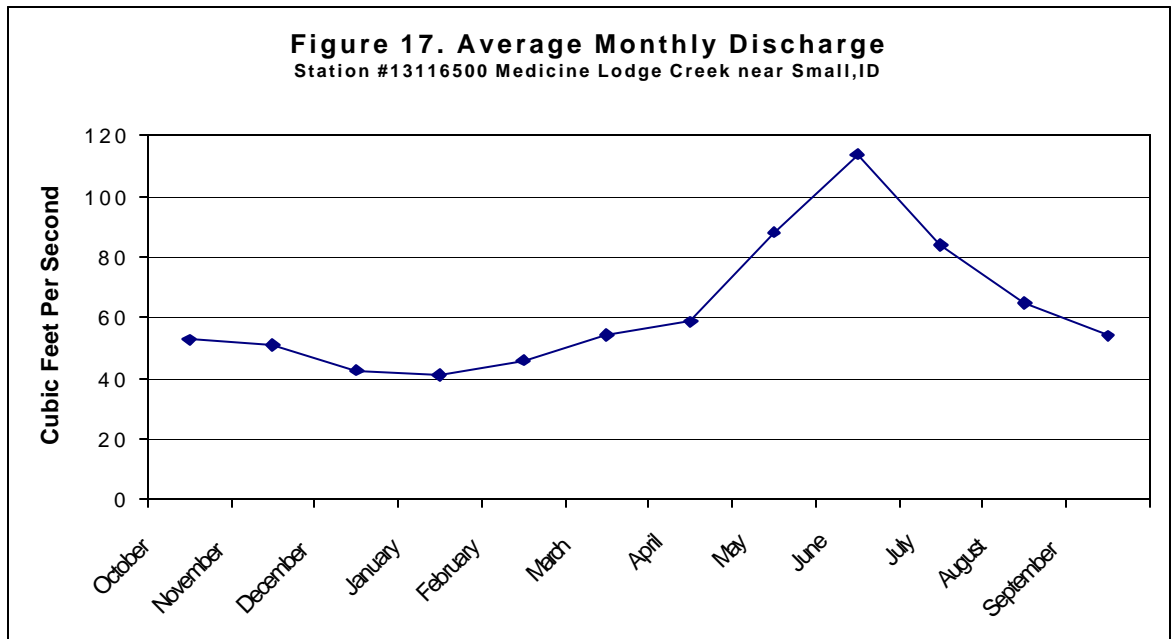
Past and existing water quality data was provided from the following agencies and/or organizations for the development of the Medicine Lodge Subbasin Assessment and TMDL. Data sources used in this section include: USGS, BLM, USFS, IASCD, SCC, and the IDF&G.

### Flow Characteristics

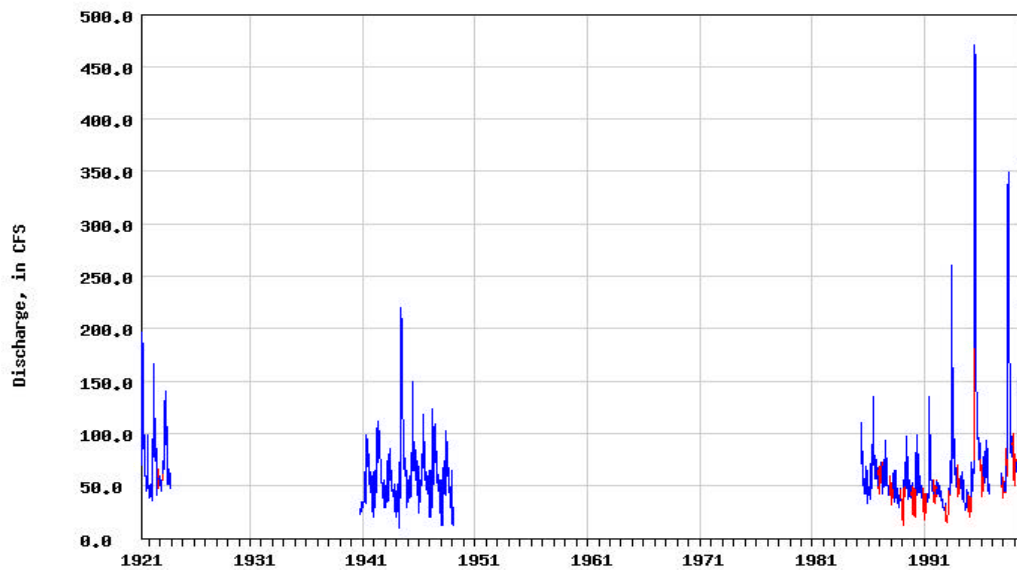
The USGS station data discussed in section 1.1 is from the stations at Small, ID and Ellis Ranch. Figure 17 shows the average monthly discharge for Medicine Lodge Creek, station number 13116500 at Small, ID. This is averaged for the entire period of record, 1940-1969.

At gauging station number 13116500 at Small, ID, the annual mean flow for water years 1921-1999 is 63.3 cfs (cubic feet per second). Annual Runoff at this station typically peaks during the last few days of May or the first week of June. The highest flow recorded was on June 15, 1995 when flow reached 470 cfs. 1999 recorded the highest annual mean of 109 cfs. Minimum annual flows typically occur in early January when flow has been recorded as low as 10 cfs on March 15, 1944. The lowest annual mean was recorded in 1992 at 41.3 cfs. (USGS 1999)

Figure 18 shows the four periods of record for Medicine Lodge Creek, station number 13116500. Figure 19 – 22 breakout each of the four periods of record for data collected at station 113116500. Gaps in the hydrograph represent the years when data was not collected. This graph shows the severity of the storm events in the mid to late 1990s. The 1995, 1998 and 1999 water years were higher than any other water years on record. The period of high flow in 1995 caused the failure of several structures in the drainage and has left scars such as cut banks that can still be seen today.



**Figure 18. USGS historical daily values graph for Medicine Lodge Creek near Small, ID, station number 13116500, for dates 04/19/1921 through 10/30/1999**



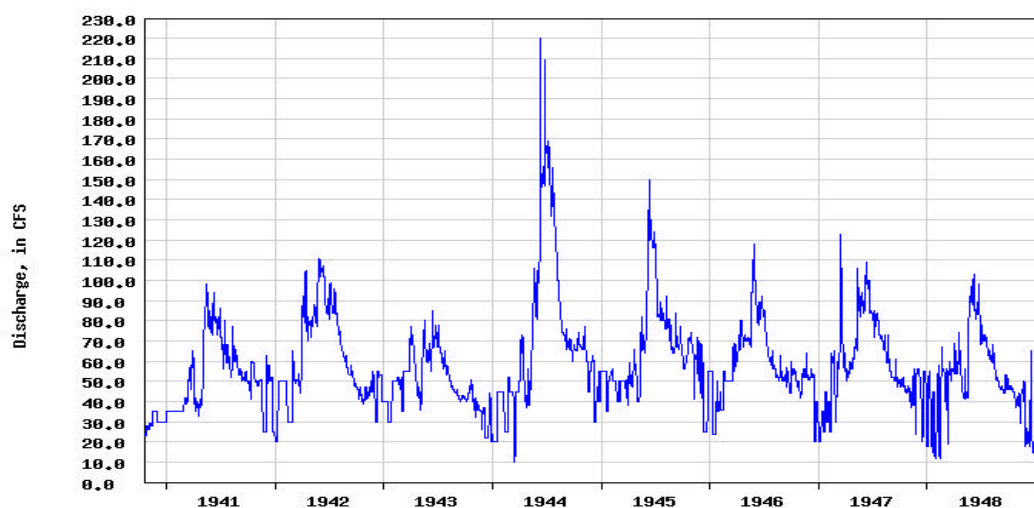
Source: <http://waterdata.usgs.gov/nwis-w/ID/index.cgi?statnum=13116500>

**Figure 19. USGS historical streamflow daily values graph for *Medicine Lodge Creek near Small, ID*, station number 13116500, for dates 04/19/21 through 12/01/1923.**



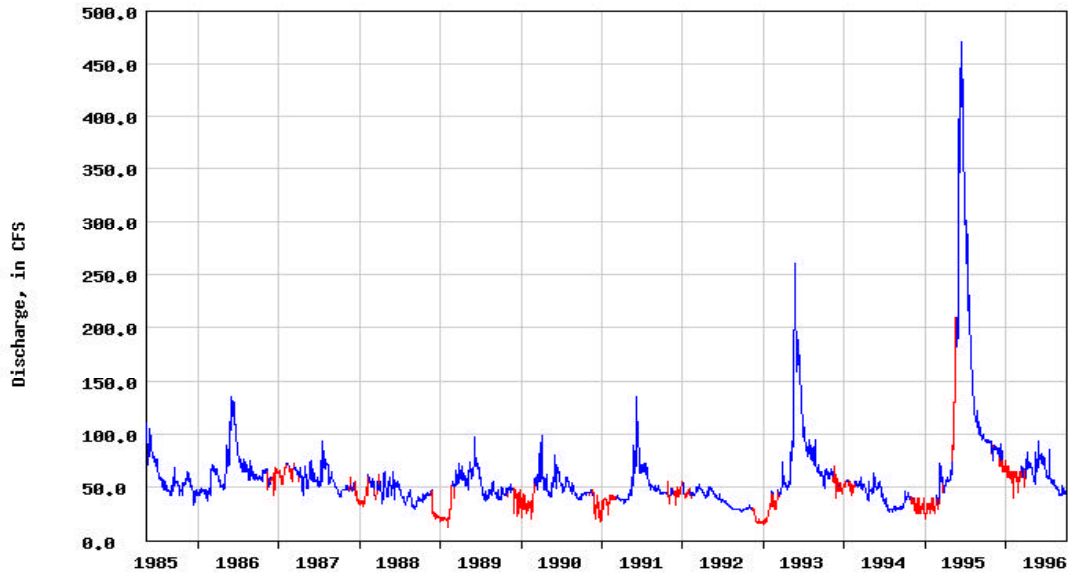
Source: <http://waterdata.usgs.gov/nwis-w/ID/index.cgi?statnum=13116500>.

**Figure 20. USGS historical streamflow daily values graph for *Medicine Lodge Creek near Small, ID*, station number 13116500, for dates 10/18/1941 - 02/02/1949**



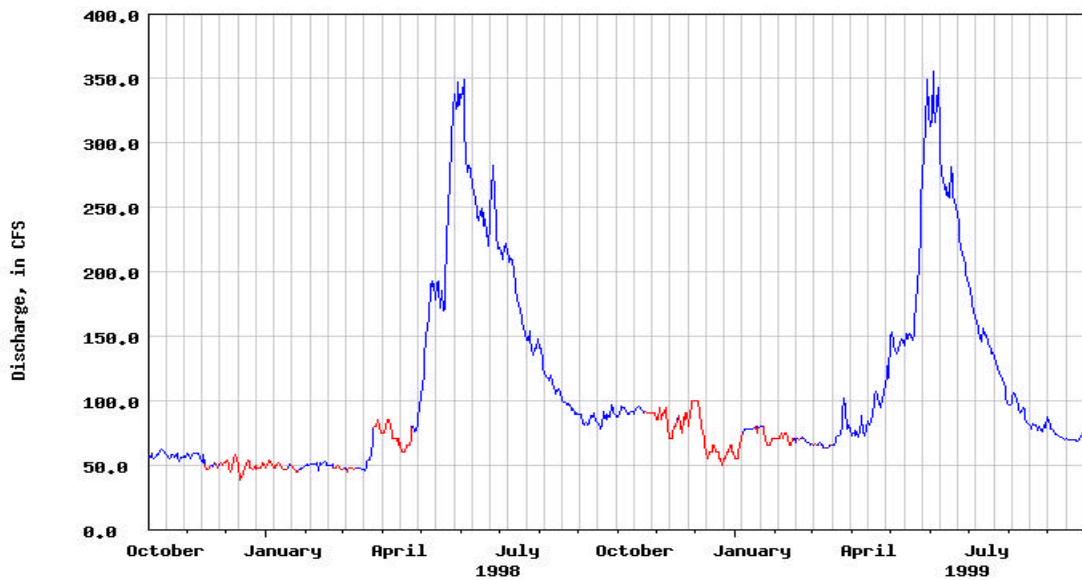
Source: <http://waterdata.usgs.gov/nwis-w/ID/index.cgi?statnum=13116500>.

**Figure 21. USGS historical streamflow daily values graph for *Medicine Lodge Creek near Small, ID*, station number 13116500 for dates 05/07/1985 through 09/30/1996**



Source: <http://waterdata.usgs.gov/nwis-w/ID/index.cgi?statnum=13116500>

**Figure 22. USGS historical streamflow daily values graph for *Medicine Lodge Creek near Small, ID*, station number 13116500 for dates 10/01/1997 through 09/30/1999**



Source: <http://waterdata.usgs.gov/nwis-w/ID/index.cgi?statnum=13116500>

## Water Column Data

This section summarizes temperature data, surface fine sediment data, and depth fine sediment data collected on stream within the Medicine Lodge subbasin. Data for listed and non-listed streams are included in this section.

### *Stream Temperature Data*

The DEQ, BLM and the USFS have collected stream temperature data in the Medicine Lodge drainage. The DEQ had twenty-two temperature sites on fourteen waterbodies during the summer of 2000. The USFS also put out two thermographs on two waterbodies during the 2000 season. The BLM sampled the area during the 1997 and 1998 seasons with seven sites on five waterbodies. Figure 23 shows the location of thermograph sampling sites.

For all of these sites, raw stream temperature was obtained and evaluated for the State of Idaho temperature criteria. These criteria are in two categories, cold water aquatic life and salmonid spawning. The temperature criteria for cold water aquatic life is 22°C (66.2°F) or less with a maximum daily average of no greater than 19°C (71.6°F). The criteria for salmonid spawning is 13°C (55.4°F) or less with a maximum daily average no greater than 9°C (48.2°F). [IDAPA 58.01.02.250.02] A major exceedance is when the criteria are exceeded 10% of the time or more or two exceedances in two separate 24-hour periods. See table 10-12 for temperature data exceedances on each site and thermograph locations for each stream.

The 1997-1998 temperature data collected by the BLM had a major exceedance of the salmonid spawning criteria on every stream that was sampled. There are no exceedances of the cold water aquatic life criteria. Most of the data collected in the year 2000 shows the same pattern. Both streams sampled by the USFS have major exceedances of the salmonid spawning criteria with no major exceedance of the cold water aquatic life criteria.

The DEQ data revealed major temperature criteria exceedances on several streams. Streams that exceed cold water aquatic life temperature criteria include Deep Creek and Warm Springs Creek. Data collected on Divide Creek was considered invalid since the reach was observed as dry during the sampling period. None of these streams are on the 303(d) list for temperature. Warm Springs Creek is fed by a naturally thermal spring. Upon review of temperature data for Warm Springs Creek, average daily stream temperatures remain fairly constant at 27°C throughout the 98 days of data collected, showing that the stream is strongly influenced by the thermal spring entering Warm Springs Creek.

All of the streams sampled by the DEQ had a major exceedance of the salmonid spawning criteria. The data presented in Tables 10, 11, and 12 shows the number of days that water temperature exceeded salmonid spawning criteria temperatures.

However, this table is not representative of actual water quality standard exceedances. Specific salmonid spawning periods for fish species within this subbasin will be evaluated in Section 5 of this report. Stream temperatures in upper Webber Creek, which is a stream with little impact, had criteria exceedances of the salmonid spawning criteria during spawning periods at all three sampling locations. Edie Creek and Irving Creek, both 303(d) listed for nutrients, sediment, and habitat alteration but not for temperature, showed exceedances on all thermograph data collected, four sites on Irving Creek and three sites on Edie Creek. The East Fork of Irving Creek had the fewest number of exceedances of the salmonid spawning criteria with six instantaneous measurement exceedances and eight daily average exceedances in the late spawning season for Yellowstone cutthroats and rainbow trout.

Medicine Lodge Creek and Fritz Creek are the only two streams on the 303(d) list for temperature. Medicine Lodge is listed from Spring Hollow to Small, ID while Fritz Creek is listed from the forks to the confluence of Medicine Lodge. In total, there were 4 temperature sites on the listed segment of Medicine Lodge Creek in the year 2000 and all showed a major exceedance of the salmonid spawning criteria. Fritz Creek had three temperature sites in 2000, and again, they all had a major exceedance of the salmonid spawning criteria.

**Table 10. 2000 DEQ Temperature data and number of days where water temperatures exceeded the Salmonid Spawning Criteria during the entire monitoring period.**

Stream Name	WBID No.	Salmonid Spawning inst. 13? C			Salmonid Spawning daily average 9? C		
		Days	Max. # ?C Over	Max Date	Days	Max. # ?C Over	Max Date
Crooked Creek	21	63	3.1	29-Jul	88	3.91	2-Aug
Deep Creek	18	103	12.3	5-Aug	101	9.43	2-Aug
Edie Creek, mouth	10	80	4.1	13-Jul	94	5.27	2-Aug
Edie Creek, at BLM boundary	10	89	5.1	1-Aug	94	4.51	1-Aug
Fritz Creek, mouth	16	97	5	13-Jul & 21-Jul	107	5.39	31-Jul
Fritz Creek, at forks	16	76	5.6	26-Jul	88	5.04	27-Jul
Horse Creek	15	104	6.7	23-Jun	113	6.17	13-Jul
Indian Creek	5	83	6.1	15-Jul	91	5.02	30-Jul
Irving Creek, mouth	12	82	6.1	30-Jun	98	4.99	24-Jun
Irving Creek, BLM boundary	12	95	7.4	9-Aug	92	4.98	5-Aug

		Salmonid Spawning inst. 13? C			Salmonid Spawning daily average 9? C		
Stream Name	WBID No.	Days	Max. # °C over	Max Date	Days	Max # °C Over	Max Date
Irving Creek, E. Fork	12	7	0.4	23-Jun, 24-Jun, & 30-Jun	35	0.68	1-Jul
Medicine Lodge Creek, at Small, ID	2	94	7.5	31-Jul	104	9.72	31-Jul
Medicine Lodge Creek, at Middle Cr.	6	92	6.8	2-Aug	103	8.62	31-Jul
Medicine Lodge Creek, below Spring Hollow	6	95	7.2	13-Jul & 22-Jul	101	7.61	2-Aug
Middle Creek, mouth	7	93	6.9	2-Aug	103	6.3	2-Aug
Middle Creek	7	102	8	1-Aug	106	7.7	2-Aug
Warm Creek	13	124	8	1-Aug	124	9.1	1-Aug
Warm Springs Creek	20	124	15.9	23-Aug	124	18.7	31-Jul
Webber Creek, mouth	17	89	5.6	13-Jul	97	5.2	2-Aug
Webber Creek, past USFS boundary	17	48	2.58	14-Jul	65	2.36	26-Jul
Webber Creek, past USFS boundary	17	44	2.43	14-Jul	61	2.09	26-Jul

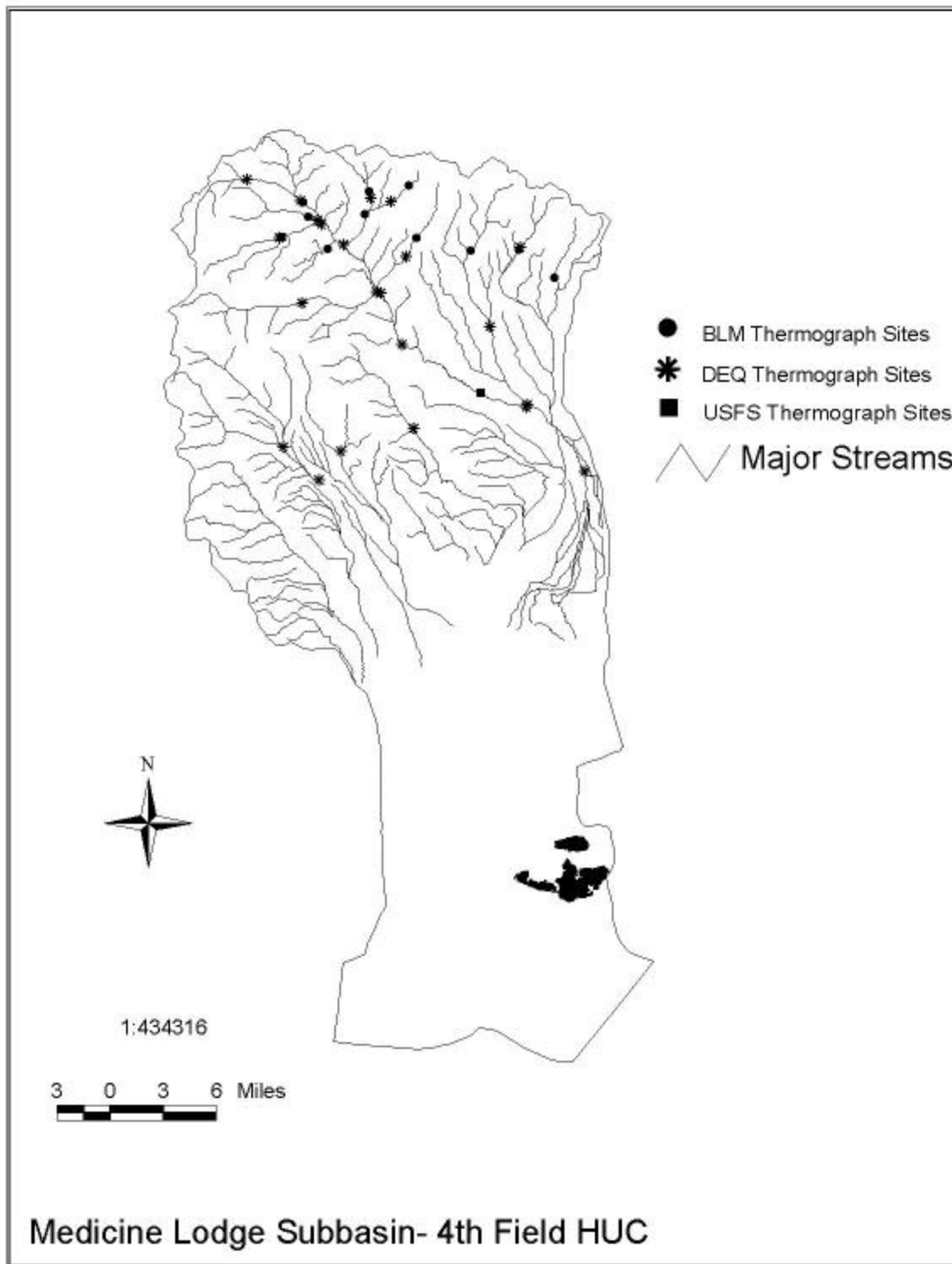
**Table 11. 1997-1998 BLM data, and Exceedances of the Salmonid Spawning Criteria**

			Salmonid Spawning inst. 13 °C			Salmonid Spawning daily average 9 °C		
Stream Name	Description	WBID No.	Days	Max # °C Over	Max Date	Days	Max # °C Over	Max Date
Indian Creek	W. Fork, at USFS boundary	5	82	4.1	16-Jul, 21-Jul, 3- Aug	88	2.9	16-Jul
Edie Creek	3 mi. above MLC confluence	10	45	1.8	7-Jun, 15- Jul, 16-Jul	14	0.3	24-Jul
Irving Creek	3/4 mi. above MLC confluence	12	45	2.2	21-Jul	69	1.7	24-Jul
Warm Creek	At USFS boundary	13	137	7.7	21-Jul, 24-Jul	137	9.9	24-Jul
Horse Creek		15	97	2.8	19-Jun	128	3.8	24-Jul
Horse Creek	Lower	15	82	6.8	19-Jul	89	5.6	18-Jul
Horse Creek	Upper	15	0			80	1.4	18-Jul

**Table 12. 2000 USFS data and Exceedances of the Salmonid Spawning Criteria**

<b>Stream Name</b>	<b>WBID No.</b>	<b>Salmonid Spawning inst. 13° C</b>			<b>Salmonid Spawning daily average 9° C</b>		
		<b>Days</b>	<b>Max # °C Over</b>	<b>Max Date</b>	<b>Days</b>	<b>Max # °C Over</b>	<b>Max Date</b>
Medicine Lodge Creek	6	69	6.11	2-Aug	75	7.26	2-Aug
Fritz Creek	16	72	7.97	26-Jul, 9-Aug	68	5.16	26-Jul





**Figure 23. Thermograph Sampling Sites**

### Surface Fines

The DEQ has been collecting water quality data to assess stream health and collecting biological samples since 1993 through BURP. A Wolman pebble count is performed on each BURP site to estimate the particle size distribution of streambed sediment. These counts entail sampling at least 50 sediment particles per transect at each of three riffles per site. Counts are obtained from the bankfull width on each side, and so include the margins of the streambed which are not normally under water and may be more depositional than the main channel. A tally is kept of the size categories into which particles fall based on the intermediate axis diameter. From these data a percentage of particles less than a set category break can be determined, such as the percent surface fines less than 6 mm (small gravel and finer) (DEQ 1998).

A size of 6 mm is often used because many salmonid species prefer particles of this size or greater for spawning and spawning success is diminished when the proportion of finer materials becomes too great. Many researchers have reported a negative correlation between percent fines and salmonid egg survival or aelvin emergence, but no threshold has been accepted. Salmonid egg survival or aelvin emergence seems to be negatively related to the proportion (in the range of 0-50%) of fines below a particle size of 0.8 to 9.5 mm in diameter (intermediate axis) (DEQ 1998).

Surface fines values and the related data is summarized in Table 13 with sample locations shown in Figure 24. There is a large amount of variability in these streams and there is very little difference between the average for the 303(d) listed streams and the total average. The average percent fines for non-listed streams is actually higher than the average for the listed streams, but the banks are much more stable. Almost half (42%) of the streams have surface fines percentages of over 50%. Indian Creek, Webber Creek and Irving Creek all have fairly low surface fines percentages. Edie Creek appeared to have a moderately low percentage of surface fines but, there is an overall increasing trend in percentage fines in the lower section of the watershed. Crooked Creek, the North Fork of Fritz Creek, Horse Creek and Warm Springs Creek all have high surface fines percentages although the banks appeared to be fairly stable.

**Table 13. DEQ Sediment Data**

Stream	WBID	Year	Elev. (ft)	Rosgen Channel Type	% Depth Fines <6 mm	% Stable		% Covered	
						Left Bank	Right Bank	Left Bank	Right Bank
Corral Creek	4	96	8200	B	54	100	100	94	73
Crooked Creek	21	97	6420	G	84	100	100	50	50
Deep Creek	18	98	5970	B	60	88	100	88	100
Divide Creek	14	97	7160	B	66	100	100	100	100
Dry Creek	9	98	6540	C	37	93	73	94	77
Edie Creek	10	94	7440	B	12	40	20	100	90
	10	94	6260		55	35	30	85	80
	10	95	7500	B	39	90	5	100	95
	10	95	6280	B	69	100	100	100	100
Fritz Creek	16	94	6930	B	38	40	70	90	100
	16	95	6930	B	65	95	95	100	100
	16	94	6520	B	41	35	40	100	100
	16	95	6496	F	54	100	100	100	100
Fritz Creek, N. Fork	16	98	7070	B	83	100	100	100	63
Fritz Creek, S. Fork	16	98	7200	B	55	84	100	84	85
Horse Creek	15	98	7190	F	45	82	85	88	83
	15	97	6550	G	85	98	100	100	100
Indian Creek	3	98	5530	F	13	91	100	87	97
Indian Creek W. Fork	5	98	7390	A	21	57	88	75	79
	5	98	7080	B	34	13	13	99	76
Irving Creek	12	98	7070	C	39	40	20	64	64
	12	95	7040	C	29	60	5	80	20
	12	94	7040	A	5	50	50	70	85
	12	94	6460	C	24	60	70	100	100
	12	95	6400	C	30	100	100	100	100

Stream	WBID	Year	Elev. (ft)	Rosgen Channel Type	% Depth Fines <6 mm	% Stable		% Covered	
						Left Bank	Right Bank	Left Bank	Right Bank
Irving Creek E. Fork	12	98	6960	B	49	93	94	85	98
Medicine Lodge Creek	11	97	6460	F	51	90	88	90	90
	6	94	6200	C	14	80	90	90	100
	6	94	5700	B	20	40	60	75	65
	2	94	5240	B	14	55	80	55	45
Middle Creek	8	98	6790	A	21	33	14	45	37
	7	97	5720	C	43	100	100	100	100
Myers Creek	21	97	6420	B	63	100	99	100	99
Warm Creek	13	95	6576	B	57	90	5	100	100
	13	94	6540	B	43	50	50	85	80
	13	95	6808	B	67	95	90	100	100
Warm Springs Creek	20	94	6640		43	70	60	100	100
	20	95	6600	F	83	100	100	100	100
	20	95	5335	E	100	70	35	100	90
Webber Creek	17	98	6871	B	39	99	100	34	87
	17	98	6380	B	25	100	99	99	96
	17	97	6560	B	42	94	100	100	100
Wood Canyon Creek	8	98	6720	A	74	59	59	59	59
Mean for 303(d) listed streams					41	66	59	90	86
Mean for Non-listed streams					53	87	89	89	88
Total Mean					47	78	75	90	87

% Fines based on Wolman Pebble count of minimum 50 particles at three transects

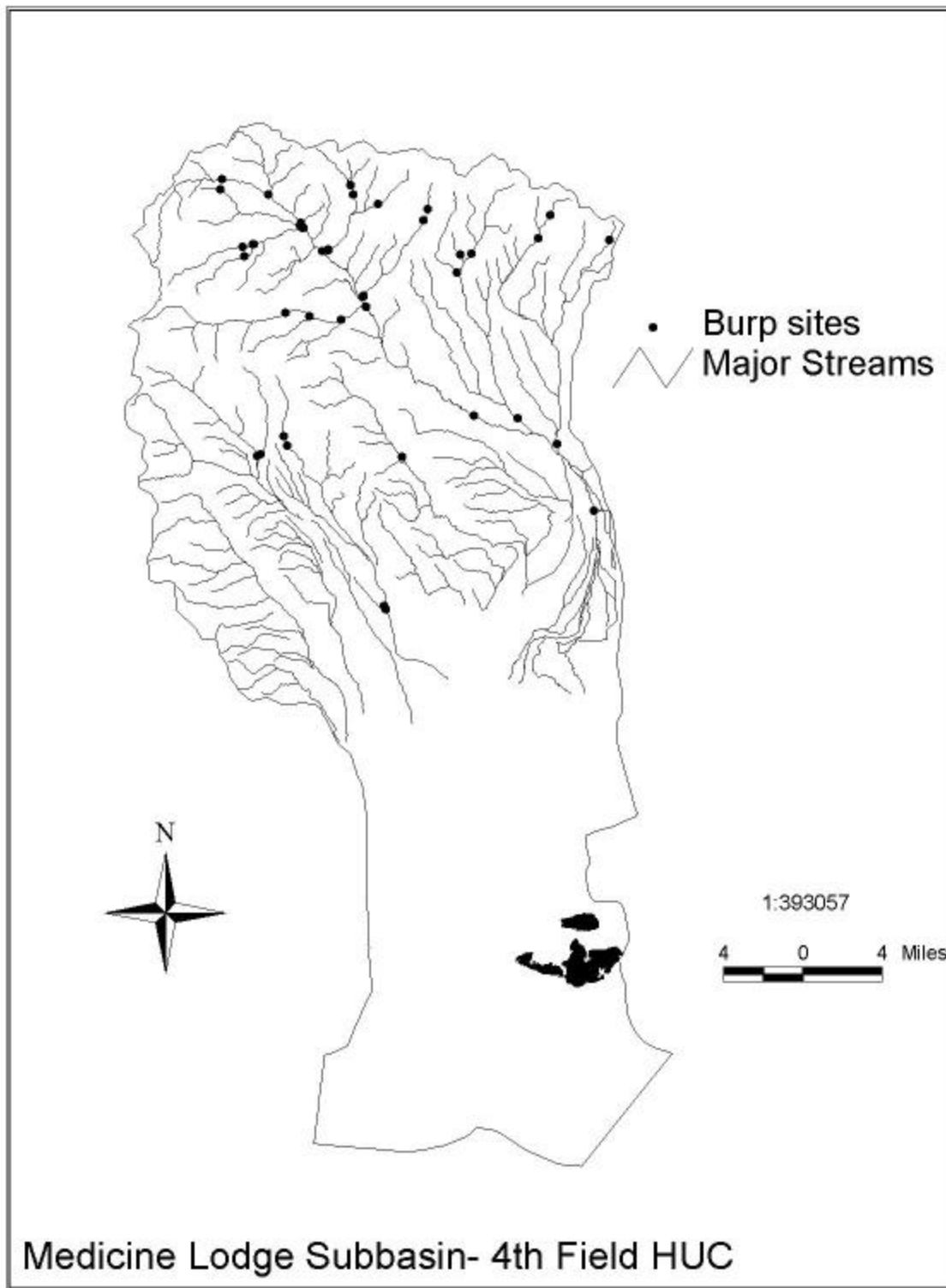


Figure 24. DEQ BURP Sites

## Depth Fines

In late August and early September of 2000, the DEQ collected McNeil sediment core samples at 10 locations throughout the subbasin. 11 more sites were sampled in 2001. Sediment core data evaluates subsurface fine sediment to a depth of 4 in. Since surface fines can easily be swept away by spawning fish, the core samples are considered to be more biologically meaningful. The percentage of inragravel fines less than 6.35 mm is correlated with expected fry survival. Most of the sites collected were in areas with characteristics which meet salmonid spawning criteria, however there were additional data sites collected to help characterize the subbasin. Salmonid spawning sites are in bold print in Table 14 while the additional sites are in plain text.

The approximate locations of the depth fines sites are shown in Figure 25. The cumulative percentage for each depth fines site are shown in Appendix D. Any material greater than 2.5 inches has been excluded. Single repetitions were done on most of the sites in 2000, however three repetitions were done on Warm Springs Creek, Medicine Lodge Creek at Small, ID, Irving Creek, and Edie Creek. Three repetitions were performed on all of the sites in 2001. For the sites with three repetitions, the cumulative percentages were averaged.

Table 14 shows the percentage of fine material (less than 6.35 mm) for each of the sites. The DEQ has adopted a target level of 28% or less of fine particles less than 6.35 mm based on studies done by the Forest Service. The majority of the streams in the Medicine Lodge Subbasin do not meet this goal. Webber Creek, Deep Creek and Warm Springs Creek are the only streams with 28% of fine material or less and Medicine Lodge Creek at Small, ID was not much above the goal. The mid-section of Medicine Lodge Creek had the highest amount of fine material with >66% of the sample being smaller than 6.35 mm. Webber Creek, which has the least amount of human impact in the watershed, had between 20.77% and 48.37%, indicating that the watershed is naturally slightly erosive.

**Table 14. Depth Fines**

Stream	WBID No.	Date of data collection	Location	Location Description	% of fine material < 6.35mm
Medicine Lodge Creek	2	8/30/00	N 44° 13.048' W 112° 22.514'	At Small, ID	32.73
<b>Medicine Lodge Creek</b>	<b>6</b>	<b>8/29/00</b>	<b>N 44° 18.745'</b> <b>W 112° 33.188'</b>	<b>Mid-section</b>	<b>66.47</b>
Middle Creek	7	8/30/00	N 44° 16.886' W 112° 26.648'	Up MLC road on State land	47.49
<b>Middle Creek</b>	<b>8</b>	<b>7/11/01</b>	<b>N 44° 24' 19.53"</b> <b>W 112° 29' 49.95"</b>	<b>High on USFS land</b>	<b>23.54</b>

Table 14. Continued

Stream	WBID No.	Date of data collection	Location	Location Description	% of fine material < 6.35mm
Edie Creek	<b>10</b>	<b>8/29/00</b>	N 44° 23.735' W 112° 34.531'	<b>Just past BLM boundary</b>	<b>37.41</b>
Edie Creek	<b>10</b>	<b>5/8/01</b>	N 44° 23.369' W 112° 35.296'	<b>1.1 mi. up Edie Creek Road</b>	<b>54.65</b>
Edie Creek	<b>10</b>	<b>4/29/01</b>	N 44° 23.714' W 112° 34.551'	<b>Just past BLM boundary</b>	<b>36.83</b>
Irving Creek	<b>12</b>	<b>8/29/00</b>	N 44° 25.984' W 112° 37.107'	<b>Below forks</b>	<b>45.65</b>
Irving Creek	12	5/2/01	N 44° 24.585' W 112° 38.533'	Mouth	40.06
Irving Creek	<b>12</b>	<b>4/30/01</b>	N 44° 23.735' W 112° 34.531'	<b>East Fork on BLM</b>	<b>24.61</b>
Irving Creek	<b>12</b>	<b>5/1/01</b>	N 44° 26.820' W 112° 36.731'	<b>Just past BLM boundary</b>	<b>25.33</b>
Irving Creek	<b>12</b>	<b>7/10/01</b>	N 44° 27' 41.18" W 112° 37' 06.79"	<b>High on USFS land</b>	<b>50.50</b>
Warm Creek	<b>13</b>	<b>7/10/01</b>	N 44° 25' 43.21" W 112° 39' 59.14"	<b>Just above Horse Creek</b>	<b>50.99</b>
Fritz Creek	<b>16</b>	<b>8/29/00</b>	N 44° 25.237' W 112° 41.782'	<b>Just below forks</b>	<b>39.88</b>
Webber Creek	<b>17</b>	<b>8/29/00</b>	N 44° 21.813' W 112° 39.655'	<b>Just past USFS boundary</b>	<b>24.62</b>
Webber Creek	<b>17</b>	<b>5/8/01</b>	N 44° 21.648' W 112° 39.368'	<b>At bridge</b>	<b>48.37</b>
Webber Creek	<b>17</b>	<b>5/9/01</b>	N 44° 21.812' W 112° 41.272'	<b>At campground</b>	<b>27.35</b>
Webber Creek	<b>17</b>	<b>5/9/01</b>	N 44° 22.219' W 112° 36.348'	<b>Mouth</b>	<b>20.77</b>
Deep Creek	<b>18</b>	<b>9/5/00</b>	N 44° 15.343' W 112° 33.937'	<b>mid-section at road crossing</b>	<b>15.99</b>
Warm Springs Creek	20	9/5/00	N 44° 12.143' W 112° 37.519'	Road crossing at Maud Mtn.	28.06
Crooked Creek	<b>20</b>	<b>9/5/00</b>	N 44° 13.266' W 112° 41.111'	<b>Lower section</b>	<b>39.83</b>

\* **Bold type indicates that the sample was taken in salmonid spawning habitat. Additional data sites were collected to aid in characterization of subbasin.**

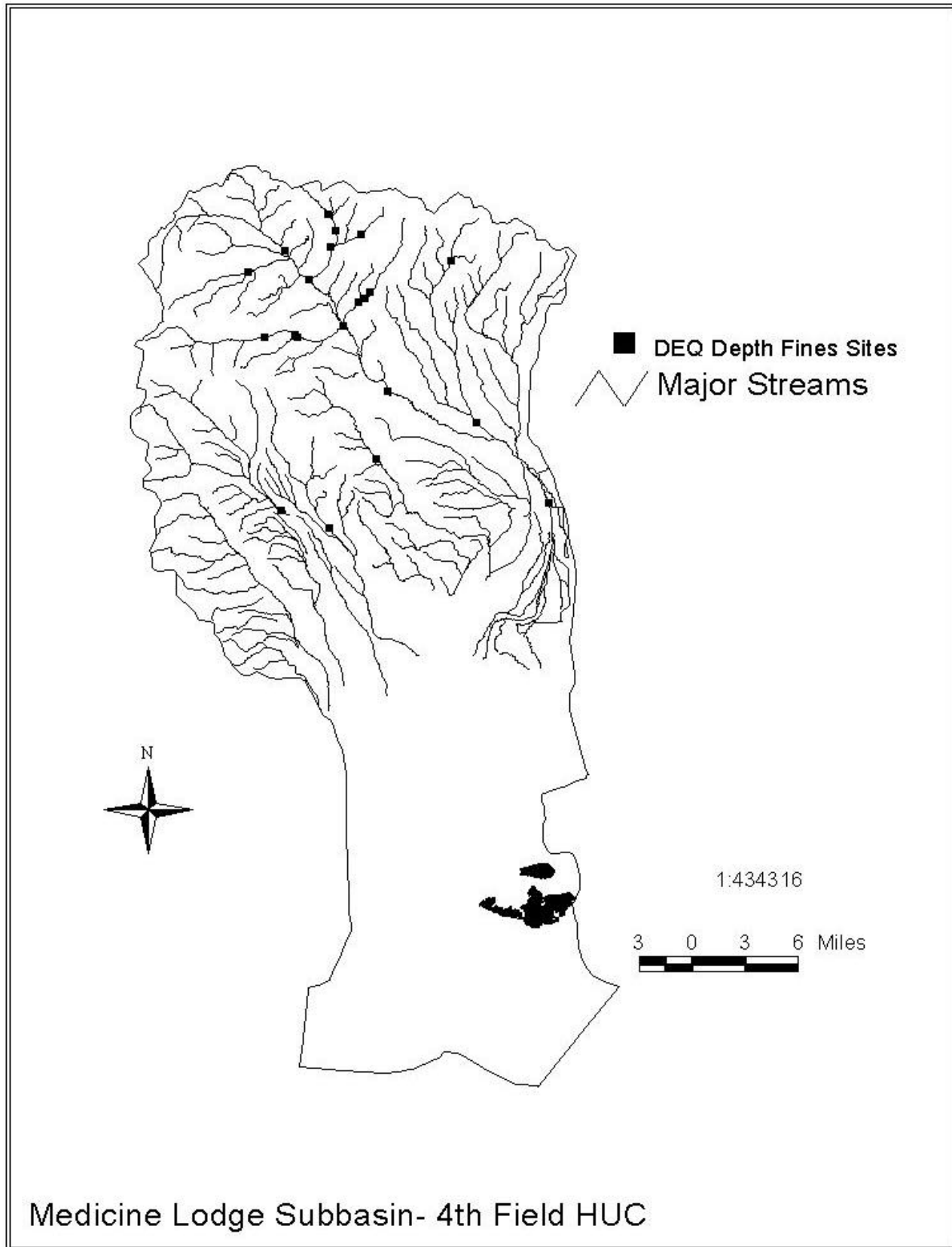


Figure 25. Depth Fine Sites



Biological and Other Data

This section summarizes fish summary data, and stream bank assessment data collected within the subbasin. Data sources include the BLM, USFS, IASCD, and DEQ.

### Fish Data Summary

Fish distribution and age classes are important documentation of the existence and status of the fish in the subbasin. Electrofishing data were collected by the DEQ, BLM, USFS and the Idaho Department of Fish and Game (IDFG). Age distribution was derived from the DEQ and BLM data, documenting the status of the aquatic life present. All of the streams in the subbasin are considered to meet the beneficial use of Cold Water Aquatic Life, and seven streams have designated beneficial uses including Salmonid Spawning.

Table 15 shows the distribution and age groups of salmonids throughout the basin, based on the information from DEQ and BLM. This data was placed together due to its consistency and completeness. The table is organized by water body identification number. The entries in the Yellowstone cutthroat, rainbow and brook trout columns indicates the number of age classes documented from the fish collected. The “J” indicates that juveniles were also documented.

The IDFG data (Table 15) and USFS data (Table 16) are shown separately due to the fact that the length distribution of the fish was not recorded. It is important to note, however, that although the age groups cannot be identified, the presence of species can. The USFS data shows the presence of Yellowstone Cutthroat in several streams where other data do not. These streams include Corral Creek, Crooked Creek, Divide Creek, the North Fork of Fritz Creek, and Webber Creek. Idaho Department of Fish and Game also found Yellowstone Cutthroat on Webber Creek although DEQ electrofishing did not.

Cold water species dominate the Medicine Lodge subbasin. Warm Springs Creek, fed from the Warm Springs, is the only stream where warm water species, non-native species of fish have been documented. Figure 26 displays the location of IDEQ and BLM fish sampling sites in the Medicine Lodge Subbasin.

**Table 15. Occurrence of fish and number of salmonid age classes in the Medicine Lodge Subbasin**

Creek Name	WBID No.	YCT	BRK	RBT	Non-salmonids	Comments	Data source	Date collected
Medicine Lodge Creek	2					no fish	IDEQ	Jul-99
Indian Creek	3			1			IDEQ	Jul-98
Indian Creek, E. Fork	4	3/J		5/J		hybrids	BLM	Oct-97
Indian Creek, W. Fork	5	3/J				hybrids	BLM	Sep-97
Indian Creek, W. Fork	5	3					IDEQ	Jul-98
Indian Creek, W. Fork	5	1			shorthead sculpin		IDEQ	Jul-98
Medicine Lodge Creek	6			2/J	shorthead sculpin		IDEQ	Sep-97
Medicine Lodge Creek	6			1/J	shorthead sculpin		IDEQ	Sep-97
Medicine Lodge Creek	6			1	shorthead sculpin		IDEQ	Sep-97
Medicine Lodge Creek	6			2	shorthead sculpin		IDEQ	Sep-97
Medicine Lodge Creek	6			4/J		hybrids	BLM	Sep-00
Middle Creek	7			1	shorthead sculpin		IDEQ	Sep-97
Middle Creek	8	3/J		4/J		hybrids	BLM	Sep-97
Wood Canyon Creek	8					no fish	IDEQ	Jul-99
Dry Creek	9			4			IDEQ	Jul-99
Edie Creek	10		2/J				BLM	Sep-97
Edie Creek	10		2		shorthead sculpin		IDEQ	Sep-97
Cold Creek	11		2/J	3/J	shorthead sculpin		BLM	Sep-99
Medicine Lodge Creek	11			3	shorthead sculpin		IDEQ	Sep-97
Medicine Lodge Creek	11			5/J		hybrids	BLM	Sep-00
Middle Creek	8					no fish	IDEQ	Jul-98
Irving Creek, E. Fork	12	1	2/J			hybrids	BLM	Sep-99
Irving Creek	12		2/J	5/J		hybrids	BLM	Sep-97
Irving Creek, W. Fork	12	3/J	2/J	3/J			BLM	Sep-97
Irving Creek	12			2	Shorthead sculpin		IDEQ	Sep-97
Irving Creek	12	2		2	Shorthead sculpin		IDEQ	Sep-99

Table 15. Continued

Creek Name	WBID No.	YCT	BRK	RBT	Non-salmonids	Comments	Data source	Date collected
Irving Creek, E. Fork	12		2				IDEQ	Jul-98
Irving Creek	12	2			Shorthead sculpin		IDEQ	Jul-98
Warm Creek	13			4/J			BLM	Sep-97
Warm Creek	13			3	Shorthead sculpin		IDEQ	Sep-97
Divide Creek	14					no fish	IDEQ	Sep-97
Horse Creek	15		2/J	3/J		hybrids	BLM	Sep-97
Horse Creek	15			3	Shorthead sculpin		IDEQ	Sep-97
Horse Creek	15					no fish	IDEQ	Jul-98
Fritz Creek	16					no fish	IDEQ	Sep-97
Fritz Creek, S. Fork	16					no fish	IDEQ	Jul-98
Fritz Creek, N. Fork	16					no fish	IDEQ	Jul-98
Webber Creek	17			4	Shorthead sculpin		IDEQ	Sep-97
Webber Creek	17					no fish	IDEQ	Jul-98
Webber Creek	17		1	1			IDEQ	Aug-00
Deep Creek	18					no fish	IDEQ	Jul-99
Myers Creek	21					no fish	IDEQ	Sep-97
Crooked Creek	22					no fish	IDEQ	Sep-97
Crooked Creek	22					no fish	IDEQ	Aug-00

YCT = Yellowstone cutthroat; BRK = Brook Trout; RBT = Rainbow Trout; J = Juvenile

**Table 16. Idaho Department of Fish and Game Fish Summary**

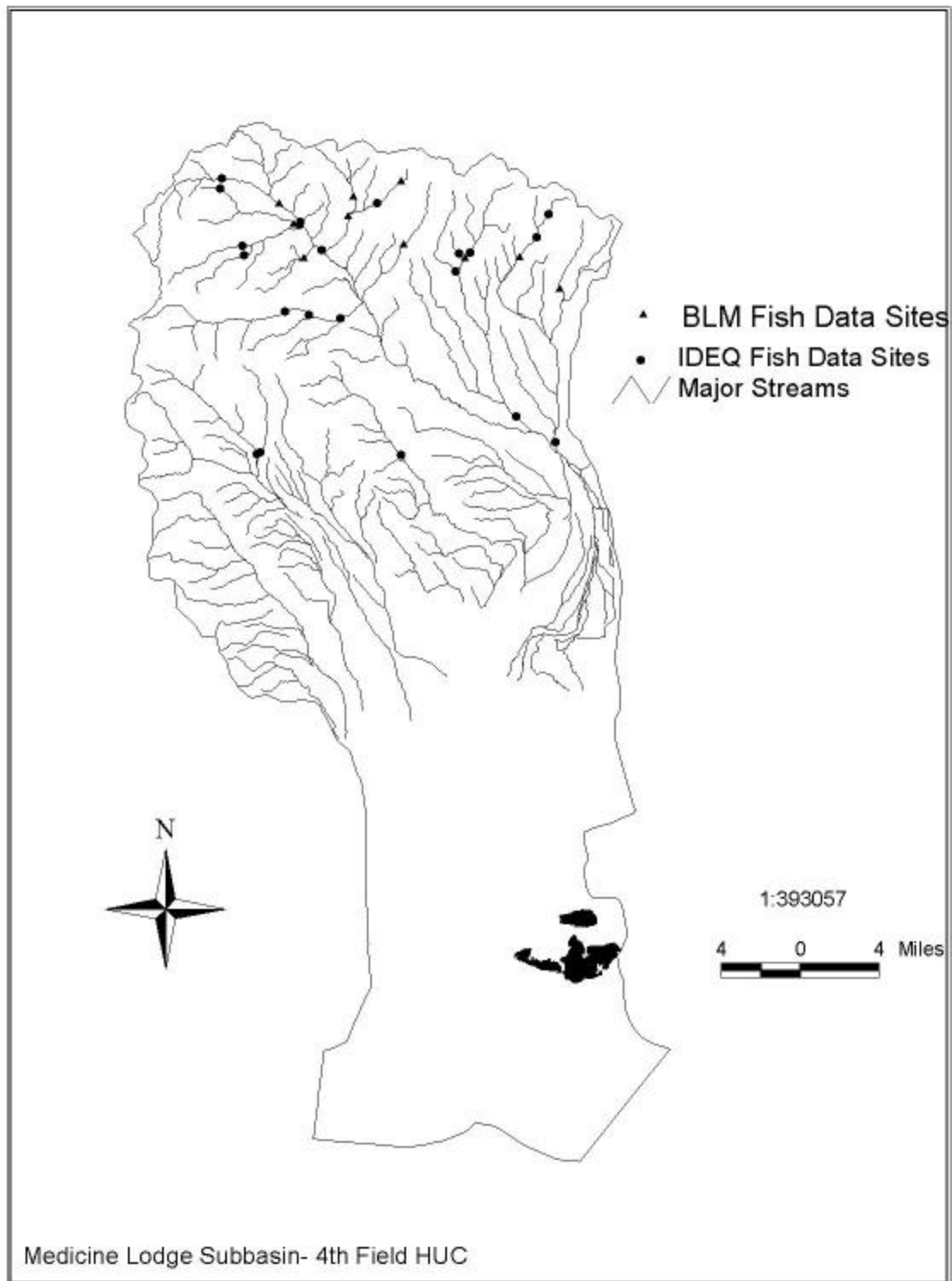
Creek Name	WBID No.	Species Composition (%)				Sampling Date	Comments
		YCT	BRK	RBT	YCT X RBT		
Irving Creek, E. Fork	12	15	77	0	8	Jun-87	YCT ripe
Irving Creek	12	70	15	8	8	Jun-87	YCT ripe
Fritz Creek	16	79	0	4	14	May-87	YCT YOY present
Webber Creek	17	5	67	26	2	Jun-87	BRK YOY present
Warm Creek	13	0	0	100	0	May-87	RBT YOY present
Warm Creek	13	0	0	99	1	May-87	RBT ripe or spent
Indian Creek	3	0	0	94	6	Jun-87	
Indian Creek	3	0	0	95	5	Jun-87	
Indian Creek, W. Fork	5	100	0	0	0	Jun-87	No fry; 1 ripe YCT
Medicine Lodge Creek	6	0	0	100	0	Jun-87	
Medicine Lodge Creek	6	1	0	97	2	Jun-87	Fish > or = 150 mm
Medicine Lodge Creek	6	8	0	82	10	Jun-87	Fish > or = 150 mm

YCT = Yellowstone cutthroat; BRK = Brook trout; RBT = Rainbow trout; YOY = Young of the year

**Table 17. U.S. Forest Service Fish Summary**

Creek Name	WBID No.	Date	YCT	BRT	RBT	YCT x RBT hybrids	Shot-headed Sculpin present
Corral Creek	4	07/23/1997	47		6	1	
Indian Creek, W. Fork	5	07/17/1997	85	1		1	*
Middle Creek	8	07/21/1997	55		8	3	
Irving Creek	12	07/21/1997	16	5	5	3	*
Divide Creek	14	09/29/1997	0	2	88	4	
Fritz Creek, N. Fork	16	07/22/1997	3		1	12	
Webber Creek	17	07/09/1997	25	12	5	8	*
Crooked Creek	21	07/03/1997	19	1			

YCT = Yellowstone cutthroat; BRT = Brook trout; RBT = Rainbow trout



**Figure 26. IDEQ and BLM Fish Sampling Sites**

*Stream Bank Assessments*

The Idaho Association of Soil Conservation Districts (IASCD) and Soil Conservation Commission (SCC) in cooperation with the Natural Resources Conservation Service (NRCS), conducted a complete stream bank assessment on private land on four of the 1998 303(d) listed streams in Medicine Lodge. The protocols followed included Stream Visual Assessment Protocol (SVAP), Proper Functioning Condition (PFC), and a streambank erosion condition inventory (SECI) worksheet.

SVAP is a protocol that allows an interdisciplinary team of three or more people to assign a score for each reach in different categories. The categories scored include: channel condition, hydrologic alteration, riparian zone, bank stability, water appearance (clarity), nutrient enrichment, barriers to fish movement, instream fish cover, pools, macroinvertebrate presence and habitat, riffle embeddedness and the presence of manure. Each of these categories is given a score from a range of numbers. The scores are then added to give the reach a grade of poor, fair, good or excellent.

PFC is a technique that is primarily used to determine which stream reaches are at greater risk. This allows land managers to prioritize their efforts and determine which areas need to be looked at closer. PFC protocol requires an interdisciplinary team of three or more people to walk a reach and then answer a series of questions about the hydrologic, vegetative and soil erosion on the reach. The answers then determine if the reach is in properly functioning condition (PFC), functional at risk (FAR), or nonfunctional (NF). Within each of these three categories, the team determines if it is in the high, medium or low range and if the trend is upward or downward.

The SECI worksheet also gives a score to different factors of the reach. These include: bank stability, bank condition, vegetative cover, channel shape, substrate, and deposition. The scores determine if the reach has slight, moderate or severe erosion problems. The eroding segments of the stream reach are also measured in length and width and recorded.

Irving Creek, Edie Creek, Fritz Creek and Medicine Lodge Creek were all assessed in this process. Irving Creek was separated into four reach segments, two located from the forks to the confluence with Medicine Lodge Creek and one on each fork. The total length of stream assessed was 4.2 miles and of that 0.6 miles were actively eroding banks. The estimated amount of sediment eroding from this stream, based on this survey, is approximately 223 tons/mile/year. The entire stream was determined to be functional at risk with the lowest reach being non-functional. Most of the non-eroding banks along the stream had only slight erosion problems, but the banks that were eroding are classified as severe. These eroding banks are the main reason that the stream is primarily classified as functioning at risk. Although many of the banks are developing new flood plains

and are in a state of repair, it is unlikely that a large flooding event could pass through this creek without major devastation (Table 18).

Edie Creek was separated into three reaches along the private property for a total of 2.6 miles included in the assessment. The estimated amount of sediment eroding from this stream, based on this survey, is approximately 56 tons/mile/year. Edie Creek was determined to be in properly functioning condition with slight to moderate erosion problems. All three segments received a fair SVAP score (Table 19).

Fritz Creek was separated into four different reaches totaling 2.2 miles of stream assessed. This was a continuous assessment from the U.S. Forest Service boundary (0.27 miles below the forks) to the confluence with Medicine Lodge Creek. The lowest segment was determined to be FAR, but the rest of the stream was rated as PFC. Fritz Creek was determined to have only slight erosion problems according to the SECI worksheet, and all but one reach was given a Fair rating under SVAP. The estimated sediment load from the stream assessed is 25.4 tons of sediment/mile/year (Table 20).

Medicine Lodge Creek was assessed from the confluence of Fritz and Warm Creek down to Small, ID, totaling almost 29 river miles. Several small segments of stream located on BLM land was excluded from the survey. A summary of the data collected is located in Table 21. SECI scores were divided between the segments of stream which were eroding and non-eroding. Most of the non-eroding banks had a slight to moderate erosion problem, while the eroding banks were primarily seen to have severe erosion problems. The estimated erosion rate based on this survey is 1,765 tons of sediment/mile/year.

The data presented shows the dramatic difference in erosion rates between these listed streams. Medicine Lodge Creek has the most severe erosion problems, and is the largest stream in the subbasin with the most hydrologic power. Of the tributaries, Irving Creek has the highest rate of erosion.

The BLM also conducted riparian assessment evaluations in Medicine Lodge from 1993 through 2000. This primarily consisted of the PFC protocol (see Table 22). Of the streams on the 1998 303(d) list, Edie Creek and Medicine Lodge Creek were rated as functional at risk while Warm Springs Creek and Irving Creek were rated as nonfunctional.

**Table 18. IASCD Irving Creek Streambank Assessment Summary**

Reach	WBID	Reach Length (mi)	Reach Slope (%)	Reach Drainage (mi <sup>2</sup> )	PFC Range	SVAP	SECI	Tons/Year	Tons/mile/year
I1	12	2.3	2.1	21	NF	Poor	Slight/Moderate	361	156.96
I2	12	0.5	2.1	16.4	FAR	Good	Slight/Severe	72	144.00
IW	12	1	4.3	5.2	FAR	Poor	Slight/Severe	522	522.00
IE	12	0.9	2.7	6	FAR	Fair	Slight/Severe	94	104.44
<b>Total</b>		<b>4.7</b>						<b>1049</b>	<b>223.19</b>

**Table 19. IASCD Edie Creek Streambank Assessment Summary**

Reach	WBID	Reach Length (mi)	Reach Slope (%)	Reach Drainage (mi <sup>2</sup> )	PFC Range	SVAP	SECI	Tons/Year	Tons/mile/year
E1	10	0.5	1.3	10.8	PFC	Fair	Slight	10.8	21.6
E2	10	1.6	3.7	9.7	PFC	Fair	Moderate	83.8	52.38
E3	10	0.6	4	7.3	PFC	Fair	Moderate	56.7	94.5
<b>Total</b>		<b>2.7</b>						<b>151.3</b>	<b>56.04</b>

**Table 20. IASCD Fritz Creek Streambank Assessment Summary**

Reach	WBID	Reach Length (mi)	Reach Slope (%)	Reach Drainage (mi <sup>2</sup> )	PFC Range	SVAP	SECI	Tons/Year	Tons/mile/year
F1	16	0.3	1.6	18.2	FAR	Fair	Slight	6	20
F2	16	0.6	4.4	17.8	PFC	Fair	Slight	20	33.333
F3	16	0.8	0.2	17.5	PFC	Poor	Slight	19	23.75
F4	16	0.5	1.1	13.9	PFC	Fair	Slight	11	22
<b>Total</b>		<b>2.2</b>						<b>56</b>	<b>25.45</b>



**Table 21. IASCD Medicine Lodge Creek Streambank Assessment Summary**

Reach	WBID	Reach Length (mi)	Reach Slope	Reach Drainage (mi <sup>2</sup> )	PFC Range	SVAP	SECI	Tons/Year	Tons/mile/year
MLC 1	2	1.8	1.3	251.7	FAR/High	Poor	Slight/moderate	100	55.6
MLC 2	2	1.8	1.1	251.4	PFC/Mid	Fair	Slight/moderate	81	45
MLC 3	2	0.45	3	250.9	FAR/Mid	Poor	Severe	157	348.9
MLC 4	6	1.15	1	250.8	PFC/Mid	Fair	Slight	63	54.8
MLC 5	6	0.7	1.1	200	FAR/Mid	Fair	Slight	10	14.3
MLC 6	6	1.33	1	152.3	PFC/Mid	Fair	Moderate	89	66.9
MLC 7	6	1.7	0.8	151.6	FAR/High	Fair	Slight/severe	146	85.9
MLC 8	6	1.49	1.1	150.4	PFC/High	Good	Slight/moderate	34	22.8
MLC 9	6	1.3	1	149.1	FAR/Mid	Poor	Moderate/severe	269	206.9
MLC 10	6	0.2	0	148				0	0
MLC 11	6	1.6	1	148	FAR/Mid	Good	Slight/severe	103	64.4
MLC 12	6	1.72	1.1	145.3	PFC/Mid	Good	Slight/moderate	62	36
MLC 13	6	1	1	144	PFC/Low	Fair	Slight/severe	72	72
MLC 14	6	1.8	1	141	FAR/Mid	Fair	Slight/severe	217	120.6
MLC 15	6	2.3	1.3	136.2	PFC/Low	Good	Slight/severe	93	40.4
MLC 16	11	1.59	3	120	FAR/High	Fair	Slight/severe	117	73.6
MLC 17	11	1.6	1	89.2	NF/Mid	Poor	Moderate/severe	302	188.8
MLC 18	11	1.3	2.2	86.5	FAR/Mid	Fair	Slight/severe	124	95.4
MLC 19	11	0.65	1.3	64.7	FAR/High	Fair	Slight/moderate	28	43.1

Table 21 Continued									
Reach	WBID	Reach Length (mi)	Reach Slope	Reach Drainage (mi <sup>2</sup> )	PFC Range	SVAP	SECI	Tons/Year	Tons/mile /year
MLC 20	11	0.7	0	64.3	PFC/Mid	Good	Moderate	18	25.7
MLC 21	11	1	2	56.5	PFC/Low	Fair	Slight	17	17
MLC 22	13	1.5	1.7	38.5	PFC/Mid	Fair	Moderate	41	27.3
MLC 23	13	0.2	3.2	25.3	FAR/Mid	Poor	Moderate	12	60
<b>Total</b>		<b>28.88</b>						<b>2155</b>	<b>74.62</b>

**Table 22. BLM Summary of Medicine Lodge Stream Riparian Condition (1993-2000)**

Stream	WBID	Rosgen Channel Type	Health	Trend	Miles
Black Canyon Creek	13	NA	PFC	Unknown	0.52
Cabin Creek	4	B6c, C6b	FAR	Static	1.32
Cabin Creek	4	A4	NF	Unknown	1.0
Cold Creek	11	G4	FAR	Up	0.85
Corral Creek	4	A2a	FAR	Static	0.5
Deep Creek	18	C	NF	Static	5.17
Deep Creek (S. Fork)	18	C6	NF	Down	4.34
<b>Edie Creek</b>	<b>10</b>	<b>A4, B4</b>	<b>FAR</b>	<b>Up</b>	<b>4.81</b>
Horse Creek	15	A4, G4	PFC	Up	1.4
Indian Creek (E. Fork)	4	B3, B4c	PFC	Up	4.1
Indian Creek (W. Fork)	5	B	FAR	Unknown	1.91
Indian Creek (W. Fork)	5	A4	NF	Unknown	2.06

Table 22 Continued Stream	WBID	Rosgen Channel Type	Health	Trend	Miles
Irving Creek (E. Fork)	12	B4a	FAR	Static	1.6
<b>Irving Creek (W. Fork)</b>	<b>12</b>	<b>G4, B4</b>	<b>NF</b>	<b>Down</b>	<b>1.09</b>
<b>Medicine Lodge Creek</b>	<b>6</b>	<b>B4, E4, G4</b>	<b>FAR</b>	<b>Unknown</b>	<b>2.33</b>
Dry Creek	9	C4, C3	FAR	Static	1.16
Middle Creek	7	G4, F4	FAR	Unknown	2.61
Warm Creek	13	B5c	FAR	Unknown	0.71
<b>Warm Springs Creek</b>	<b>20</b>	<b>A, B</b>	<b>NF</b>		<b>1.77</b>

Bold type indicates that stream is on the 1998 303(d) list.

### Status of Beneficial Uses

The data presented in this section confirms the designated beneficial uses for salmonid spawning and cold water aquatic life for listed streams and unlisted streams within the Medicine Lodge Subbasin are not fully supported. The depth fines data shows the majority of sites in streams listed for sediment exceed the sediment target level of 28% or less fines.

In addition, thermograph data collected within the medicine lodge subbasin exceeds the temperature criteria for salmonid spawning in all streams sampled. Cold water fisheries and aquatic life have been observed in all streams with temperature data except Deep Creek. Therefore, it is assumed that salmonid spawning is an existing use within these streams that is not fully supported.

Thermograph data collected on the Warm Springs Creek indicates that the stream is naturally thermal with relatively constant temperatures ranging from 25°C to 28°C. Only warm water species of fish have been found in the creek, and it is therefore recommended that the stream be designated for warm water aquatic life or seasonal cold water aquatic life.

### Conclusions

- It is recommended that TMDLs for nutrients not be written for any of the streams in the watershed. The nutrient data collected by the BLM indicates that nutrient enrichment was not of concern for the streams listed for nutrients and there is no observational data present indicating excessive slime growth in any part of the watershed indicating that the listing was in error.
- Sediment TMDLs will be developed for Edie Creek, Irving Creek and Medicine Lodge Creek. Edie Creek and Irving Creek have spawning habitat within the listed reaches while the listed segment of Medicine Lodge is rearing habitat. A TMDL is still necessary for this section of Medicine Lodge Creek because sediment impacts the macroinvertebrate population, therefore impacting the food source for the fish. McNeil core sample data found more than 66% fine sediment in the Medicine Lodge Creek listed segment. It is recommended that a load reduction target be quantified for the upper reaches of Medicine Lodge Creek as well since it is a source reach for the listed segment and also contains salmonid spawning habitat.
- Temperature TMDLs are needed for all streams within the Medicine Lodge Subbasin which temperature data was collected, with the exception of Warm Springs Creek, Divide Creek, Deep Creek, and the lower section of Medicine Lodge Creek, since the lower portion is considered rearing habitat for fish and therefore not salmonid spawning habitat. All streams sampled exceed temperature criteria for salmonid spawning and it is recommended TMDLs be developed for those streams, with the exception of Deep Creek. It is likely temperature TMDLs will be met though improved width/depth ratios,

increases canopy cover, and water conservation practices that will be completed as part of the implementation plan for these TMDLs.

- Fisheries or cold water indicators were not observed in past monitoring events on Deep Creek, therefore, existing uses on Deep Creek have not been determined. Additional monitoring will be necessary to determine the status of beneficial uses.
- The information presented in this subbasin assessment indicated that the development of a temperature total maximum daily load (TMDL) is unnecessary for Warm Springs Creek because it is naturally thermal. It is recommended that Warm Springs Creek be delisted for sediment since depth fines data collected was at 28% and streambanks appeared to be in fairly stable condition.

## 2.4 Data Gaps

Water quality data gaps that currently exist in the Medicine Lodge subbasin include:

- Further investigation of nutrients is needed to determine beneficial use status of the nutrient listed streams. Nutrient samples have not been taken on Fritz Creek, which is on the 1998 303(d) list for nutrients. Nutrient sampling in the rest of the subbasin has been conducted by the BLM, but since there is no BLM land on Fritz Creek, they have not sampled it.
- Fish sampling is quite comprehensive throughout the subbasin, however, it would be helpful to conduct more electrofishing on Crooked Creek. The USFS found 19 Yellowstone Cutthroat trout in the creek in 1997, but did not measure the fish. We do not know how many age classes are present, and therefore cannot assess the health of the population. The DEQ also electrofished Crooked Creek in 1997 and again in 2000, but did not collect any fish.
- Additional streambank erosion inventories should be conducted on all listed streams. The Soil Conservation Commission collected a wealth of streambank assessment information including streambank erosion inventories for four of the streams on the 1998 303(d) list. These inventories only included private land, however, and complimentary information should be collected for the upper reaches of these streams.
- Further thermograph data should be collected on all streams within the Medicine Lodge Subbasin. Additional thermograph data on Divide Creek should be collected since the stream reach was observed as dry during the 2000 sampling period, causing the data collected to be considered invalid. Existing data presented in this document suggests that all streams within the Subbasin, with the exception of Warm Springs Creek, Divide, Creek, Deep

Creek, and the lower end of Medicine Lodge Creek, need a temperature TMDL. Additional thermograph data on Warm Spring creek should be collected to determine beneficial use attainment.

- Salmonid spawning temperature criteria's set in this TMDL should also be further evaluated during implementation of this TMDL to ensure the standards set are reflective of spawning time periods in the Medicine Lodge Subbasin.
- No data has been collected on Blue Creek. It is recommended this stream be monitored to determine if it is supporting existing beneficial uses.
- Further monitoring information should be collected on Deep Creek to determine the existing uses and their status.